

Amendments to the Drawings:

The attached sheets of drawings include changes to FIGS. 5B, 5C, 6B and 6C. These sheets, which respectively include FIGS. 5B, 5C, 6C and 6C replace the original sheets respectively including those figures.

In FIG. 5B, line 410 has been moved, and " β " has been changed to $-\alpha_1-$.

In FIG. 5C, line 620 has been moved and " β " has been changed to $-\alpha_2-$.

In FIG. 6B, end boundaries of land 120a have been moved, W_1 has been changed to $-\alpha_3$ and " P_1 " has been changed to $-Q_1-$.

In FIG. 6C, line 630 has been moved, " W_8 " has been changed to $-\alpha_4-$ and " P_8 " has been changed to $-Q_8-$.

Attachments: 4 Replacement Sheets

4 Annotated Sheets Showing Changes

REMARKS/ARGUMENTS

The above amendment and the following remarks accompany a request for continued examination (RCE) of this application and are in reply to the final Office action of 08/17/2007. In light of this reply, reconsideration and further examination of this application are respectfully requested.

Twenty-two claims (1-15, 17-19 and 21-24) were pending in this application. In the above amendment 14 claims (1-14), previously withdrawn from consideration, were cancelled, six claims (15, 17-19, 21 and 22) were amended, and one new claim (25) was added. Accordingly, nine claims (15, 17-19 and 21-25) are presented herein for reconsideration and further examination.

On page 2 of the Office action, the Examiner required a substitute specification excluding the claims pursuant to 37 CFR 1.125(a), stating,

"in the original specification, several paragraphs have been corrected and few paragraphs have been removed. Thus the paragraphs need to be renumbered."

Responsively, Applicant has enclosed herewith an Amended Specification, with the changes made therein indicated in accordance with 37 C.F.R. §1.121, together with a Substitute Specification, in which the changes have been fully incorporated and the paragraphs renumbered appropriately. No new matter has been added.

On page 3, the Examiner objected to the disclosure under 37 CFR 1.71, as being "so incomprehensible as to preclude a reasonable search of the prior art by the examiner," stating, in pertinent part,

"For example, the following items are not understood:

Applicants fail to point out the significant differences between the conventional PCB and the shrinkage PCB....

What does 'a length of interest dimension is shrunk by about 112.5 μm ' solve the non-symmetry of the conventional printed circuit board?

What does 'the thermal expansion amount of the left portion of the shrinkage printed circuit board 100 is larger than the thermal expansion amount of the right portion of the shrinkage printed circuit board 100' solve the asymmetry of the conventional printed circuit board? Will the shrinkage printed circuit board become more symmetric?

It is respectfully submitted that the amendments made in the instant specification herein resolve the objections raised by the Examiner above. For example, it should now be clear from the specification that the "shrinkage" printed circuit board and the "conventional" printed circuit

board are similar to one another in all respects except for the spacing of the land groups 120 to which corresponding ones of the input lead groups of the TCPs 200 are to be connected during a thermocompression bonding process. In the shrinkage printed circuit board, the land groups disposed on opposite sides of a line passing through the midpoint "M" of the width of the board are respectively "shrunk," or contracted, toward the midpoint M of the board such that, when the shrinkage board expands during the thermo-compression due to heating, the respective land groups expand, or move outward laterally from the midpoint M so as to come into precise alignment with the lead groups of the TCPs.

It should be recalled that, prior to the above TCP-to-PCB bonding operation, the respective output lead groups of the TCPs are individually thermocompression bonded to a TFT substrate 300, such that the spacing or intervals between the input lead groups of the TCPs are then fixed. If the input leads are then thermocompression bonded to a conventional printed circuit board, *i.e.*, one in which the land groups are disposed at intervals corresponding to the intervals of the respective input lead groups of the TCPs, then substantial misalignment may occur between the lands of the respective land groups and respective input leads of the corresponding TCP lead groups, due to the thermal expansion of both the substrate of the PCB and the respective substrates of the TCPs, as taught by the present disclosure. Thus, the present invention teaches several methods whereby the "conventional" PCB is "shrunk" during manufacture, *i.e.*, redesigned, into a "shrinkage" printed circuit board which precisely allows for the above thermal expansions and thereby prevents the occurrence of the above misalignment between leads and lands during the thermocompression bonding process.

Additionally, as particularly pointed out in this disclosure, PCBs that are asymmetrical with respect to a line passing through the above midpoint M will have different vertical dimensions, and hence, different masses of material disposed on opposite sides of that "midline." Consequently, the PCB will have different amounts of thermal expansion on opposite sides of that line when the PCB is heated, and these different amounts of expansion must be taken into account in positioning the respective land groups on the PCB in the shrinkage PCB design. It may be noted, for example, that the film substrates of the TCP land groups are symmetrical about their respective midlines, and accordingly, expand equally in the right and left directions relative thereto when heated. Thus, it is not the object of this invention to "make the PCB more symmetric," but rather, to take the resulting asymmetry in thermal expansion of the PCB into account in

configuring the positions of the respective land groups on the shrinkage PCB so as to prevent the above misalignment problem from occurring between the leads of the TCPs and lands of the PCB during bonding.

On page 4 of the Office action, claims 15, 17-19, 21-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement on the grounds that the claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.


In light of the above amendments to claims 15, 17-19, 21 and 22, it is respectfully submitted that this rejection is now moot.

On page 8, and in alternative to the foregoing rejection, the Examiner rejected claims 15, 17-19, 21 and 22-23 under 35 U.S.C. 102(b) as being anticipated by the conventional art admitted by applicants.

However, in light of the above amendments to claims 15, 17-19, 21 and 22 and the above remarks regarding the important differences between the conventional PCB and the shrinkage printed circuit board that are now particularly pointed in the amended specification and distinctly claimed in the pending claims, it is respectfully submitted that this rejection is also moot.

In light of the above reply, Applicant respectfully submits that claims 15, 17-19 and 21-24 are in an allowable form, and accordingly, respectfully requests that a timely Notice of Allowance be issued in this case.

If there are any questions regarding this reply, the Examiner is invited to contact the undersigned at the number below.

Certification of Facsimile Transmission	
I hereby certify that this paper is being facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.	
	Dec. 17, 2007
Sandra L. Carr	Date of Signature

Respectfully submitted,



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